Appendix 6.1

Longview Development, Ballyvolane: Groundwater Seepage Assessment

Finals Report

November2019

www.jbaconsulting.com

MHL & Associates Ltd

JBA Project Manager – Dr Eleanor Williams

JBA Consulting
Salts Mill
Victoria Road
Saltaire
Shipley
BD18 3LF
UK

Revision History

Revision Ref/Date	Amendments	Issued to
17/04/2019	Draft Report	Shane Moriarty
19/11/2019	Final Report	Shane Moriarty
21/11/2019	Revised Final Report	Shane Moriarty

Contract

This report describes work commissioned by Shane Moriarty, on behalf of MHL & Associates, by an email dated 11/02/2019. MHL's representative for the contract was Shane Moriarty of MHL & Associates Ltd. Michael McDonald and Eleanor Williams of JBA Consulting carried out this work.

Prepared by ..... Eleanor Williams PhD BSc MSc

Senior Hydrogeologist

Reviewed by ..... Michael McDonald BSc MSc PhD CGeol FGS

Technical Director Hydrogeology

Purpose

This document has been prepared as a Draft Report for MHL & Associates Ltd. JBA Consulting accepts no responsibility or liability for any use that is made of this document other than by the Client for the purposes for which it was originally commissioned and prepared.

JBA Consulting has no liability regarding the use of this report except to MHL & Associates Ltd.

Copyright

Carbon Footprint

A printed copy of the main text in this document will result in a carbon footprint of 91g if 100% post-consumer recycled paper is used and 115g if primary-source paper is used. These figures assume the report is printed in black and white on A4 paper and in duplex.

JBA is aiming to reduce its per capita carbon emissions.

Contents

List of Figures

1 Introduction

1.1 Background and Objectives

Longview Estates Ltd is constructing a housing development on the R614 (Ballyhooly Road) north of Cork. The development proposals involve earthworks to form development platforms which will require and cut and fill extending through the superficial strata to the underlying bedrock.

Attenuation tanks are being developed to accommodate surface runoff to a storm design. As part of the inputs to the runoff design, the need to accommodate seepage from groundwater is required.

This report provides a preliminary and high-level assessment of the groundwater conditions at the site, and outlines the potential for seepage to occur from areas of cut.

This assessment uses desk-based data from both freely available information about the site e.g. online geological mapping, and the findings of a ground investigation completed in February 2019 by Priority Geotechnical and provided by MHL & Associates (MHL) regarding the site. An understanding of the water environmental setting of the site is presented. This is used to determine the potential for seepage at the site. This report does not provide recommendations for a design solution for site drainage.

The report first provides a summary of relevant baseline data and a conceptual understanding of the local hydrogeology, using baseline data with respect to the regional and site geology, hydrology and hydrogeology, and in conjunction with existing ground investigation data for the site.

These data are utilised to make a preliminary assessment of the potential groundwater flow volumes which may be observed as seepage from areas of cut where the proposed new ground level is at a lower elevation than observed groundwater levels.

1.2 Site Design

The site is situated on a west-facing slope and the design involves the levelling of parts of the site via excavation to create a number of development platforms. The excavated cut areas are shown in green in Appendix A.

In summary, the main areas where cut is proposed lie in Neighbourhoods 1 and 2. Where cut is proposed, ground elevations will be reduced. Estimates by eye from the site plan suggests that these changes are in the order of 1.5-4.5 m.

1.3 Datasets

The following datasets were examined in this assessment:

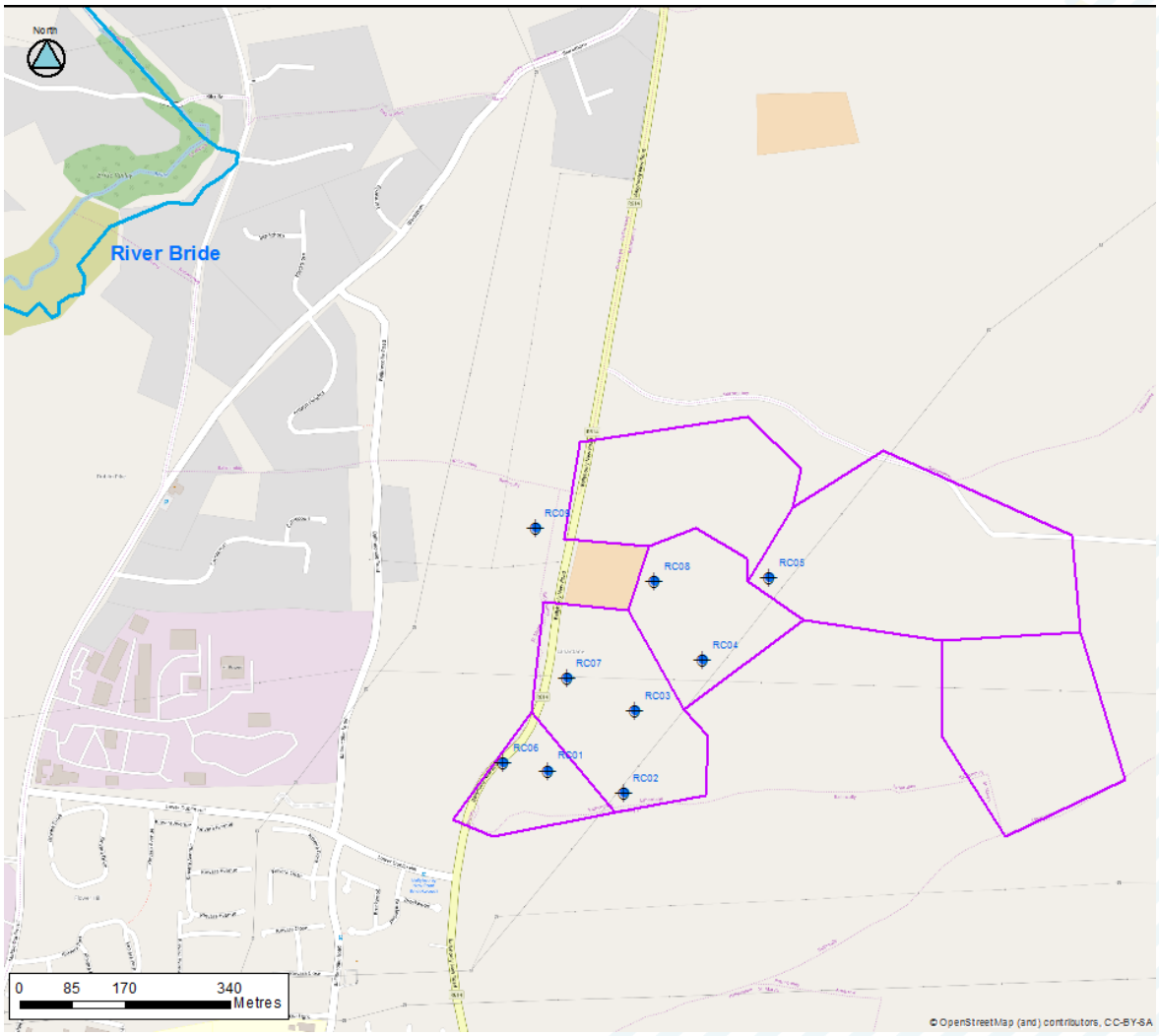
- Geological Survey of Ireland (GSI)
  - https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=bc0dba38f3f5477c8fd400f66b5eedcd
    - Groundwater wells and springs
    - Karst
    - Drinking water protection areas
    - Groundwater vulnerability, recharge and resources
    - Quaternary sediments
    - Bedrock geology
- Environmental Protection Agency (EPA)
  - https://gis.epa.ie/EPAMaps/
    - Water quality monitoring locations
    - WFD water body risk
    - WFD water body status
    - River Q values 1971-2016
    - Protected areas
- GeoHive
  - http://map.geohive.ie/mapviewer.html
    - Topography
    - Land use
    - Historic land use
- Met
  - http://www.met.ie/
- Priority Geotechnical, 2019. Longview Housing Development, Ballyvolane, Co. Cork. Supplementary Ground Investigation, Interpretative Report.
- MH&L & Associates Ltd, 2019. Longview Estates Development – Overall road design plan.
- Fetter, C.W. 2001. Applied Hydrogeology. 4th Edition, Prentice Hall.

2 Baseline Environment

2.1 Site Location, Land Use and Topography

The site is located to the north of Cork on the R614 (Ballyhooly Road) (Figure 2-1). The boundaries of the various development platforms are shown on this figure.

Figure 2-1 Site Location and Watercourses



The site is bordered to the west by the R614. To the east, north and south the site is bounded by arable fields. The site is assumed to be greenfield from an inspection of online historic mapping.

The site is gently sloping up to the east, from approximately 70 mAD on the west side, to 130 mAD in the east. Beyond the site to the west, ground elevations continue to fall in a southerly direction. Spot data (Appendix A) indicate that elevations vary from: ~61.12 mAD in the south west corner of the site; ~69 mAD in the north west corner of the site; ~125 mAD in the north east corner of the site; and ~127 mAD in the south east corner of the site.

A ground investigation was completed across the site in February 2019, during which time a number of groundwater-related observations were made and surveyed. Elevation data are available are at the locations of the rotary drilled boreholes (RC

numbers). The current ground elevation, drilled groundwater level and proposed cut level are summarised in Table 2.1.

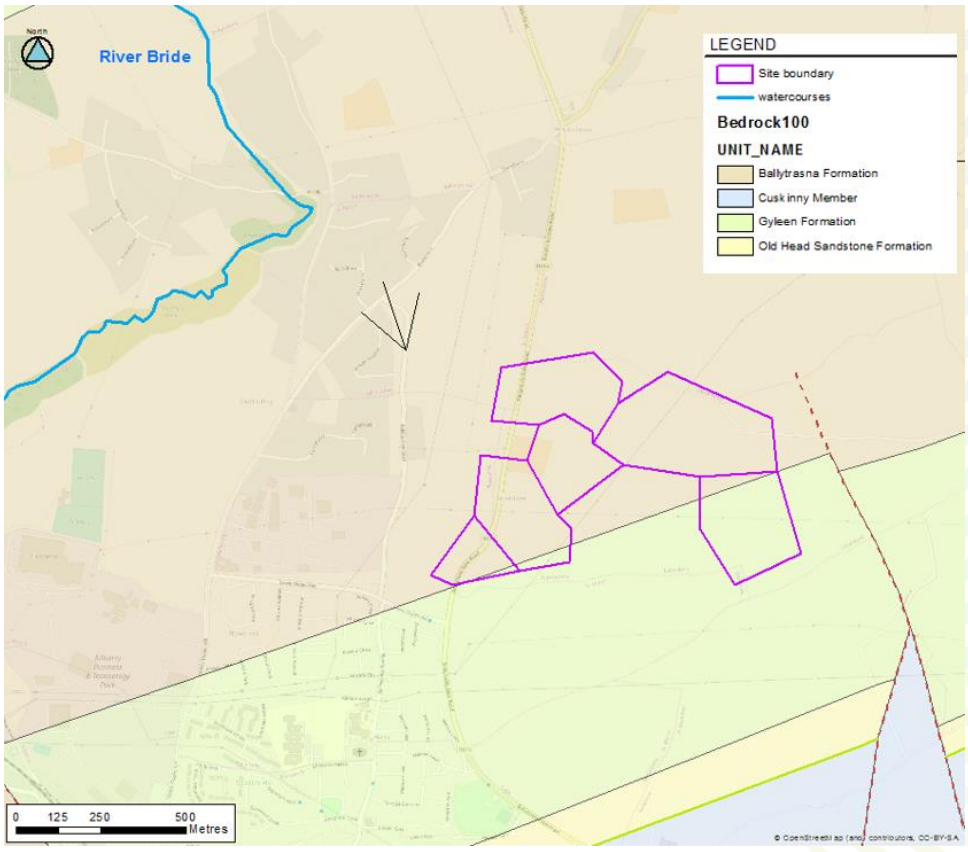
Table 2.1 Borehole/Spot Elevation Data

Borehole ID (2019)	Ground Level (mAD)	Average GWL (mAD)	Proposed Cut Level (mAD)
RC01	75.07	71.05	71
RC02	85.61	82.71	81.28
RC03	80.99	77.14	77.25
RC04	97.04	92.91	92.59
RC05	111.05	108	109.12
RC06	65.82	63.02	67.11
RC07	74.03	71.03	75.028
RC08	88.82	87.32	91.64
RC09	70.77	70.09	n/k

2.2 Geology

According to the GSI online mapping, the site is underlain by bedrock of the Upper Devonian Ballytrasna Formation (Figure 2-2), which is characterised by dusky-red to purple mudstones with subordinate pale-red sandstones. In the south east of the site, the bedrock comprises that of the Gyleen Formation, an Upper Devonian sandstone with mudstone and siltstone.

Figure 2-2 Bedrock



The bedrock is largely covered by till derived from Devonian sandstones. In the south east of the site there are gravels derived from Devonian sandstones. In the surrounding region, there are localised areas of bedrock exposed at the ground surface and Made Ground (Urban) areas lie in Cork to the south. Superficial deposits are shown in Figure 2-3.

Figure 2-3 Superficial Deposits

Geological information is supported by site investigation data from February 2018, comprising 24 trial pits which were excavated to 1.8 to 3.5 m below ground level (bgl) (Priority, 2019). In the south west of the site (TPs 1-10), gravelly silt and gravelly clay were encountered. Further north (TPs 11-13), the substrate comprised predominantly gravelly silt. To the west (TPs 21-24) lies clayey sandy gravel. On the higher ground (TPs 16-20), clayey sandy gravel, cobbles or clayey gravelly silt were encountered.

In addition, nine boreholes were drilled, between 3 and 9.5 mAD, which indicate slightly sandy gravelly clay, overlying fractured and weathered purple siltstone with sandstone bands, and sandstones. In places the clay was up to 4.3 m thick whilst, in others, bedrock was encountered at the ground surface.

Borehole logs and locations are provided in Appendix B.

2.3 Climate

Rainfall has not been recorded on site. Long term average rainfall data are available from Met Éireann where the nearest site with comprehensive data is at Cork Airport,

~8 km south west of Skibbereen. The mean annual average rainfall is 1214 mm/yr for the period 2016-2018.

The potential evaporation for the same period ranges from 505.4 to 546.5 mm/yr whilst actual evaporation ranges from 740.5 to 785.3 mm/yr.

2.4 Surface Water

Watercourses are mapped in Figure 2-1. The River Bride lies west of the site, and flows south to join the River Lee in Cork.

The site does not lie directly within a flood plain and the nearest flood zone, which is a very small and isolated area, lies ~1.30 m south of the site, close to the R635. The Lee Estuary is a designated a WFD transitional water body (IE_SW_060_0950), with an ecological status of Moderate, and deemed to be At Risk. There are no water quality Q values in the transitional portion of the River Lee.

The River Bride is not designated as a river water body and, therefore, does not currently have a WFD status.

2.5 Hydrogeology

The site is underlain predominantly by bedrock comprising Devonian mudstones and sandstones which are classified as a Locally Important[1] aquifer (Figure 2-4), that is generally only moderately productive in local zones.

Although underlain by till, the hydrogeological setting is deemed to be Extreme permeability subsoil across much of the site due to the thin depth of till. The Geological Survey of Ireland states that groundwater vulnerability is a term used to represent the natural ground characteristics that determine the ease with which groundwater may be contaminated by human activities. In places, there are areas of rock at or near surface, although where deposits are thicker to the north west, vulnerability is categorised as High (Figure 2-5).

Regarding water quality, the underlying Ballinhassig East aquifer is considered to be Unassigned for WFD risk, with a 2010-2015 WFD water quality status of Good. No groundwater data are available for the site.

There are no mapped karst features or historic springs or wells in the vicinity of the site.

There are several groundwater springs indicated in the area. There are four within 1 km of the site, ranging from 18 to 73 m deep. The yields are reported to be 27-52 m^3/d.

Groundwater recharge is determined on GSI mapping from a combination of effective rainfall (779 mm/yr) and considerations of subsoil type and drainage characteristics. With a recharge coefficient of 22.5%, recharge is estimated at 175 mm/yr with a cap at 200 mm/yr.

1 https://www.gsi.ie/en-ie/programmes-and-projects/groundwater/activities/understanding-ireland-groundwater/aquifer-classification/Pages/Aquifer-categories-and-types.aspx

Figure 2-4 Aquifer Resource

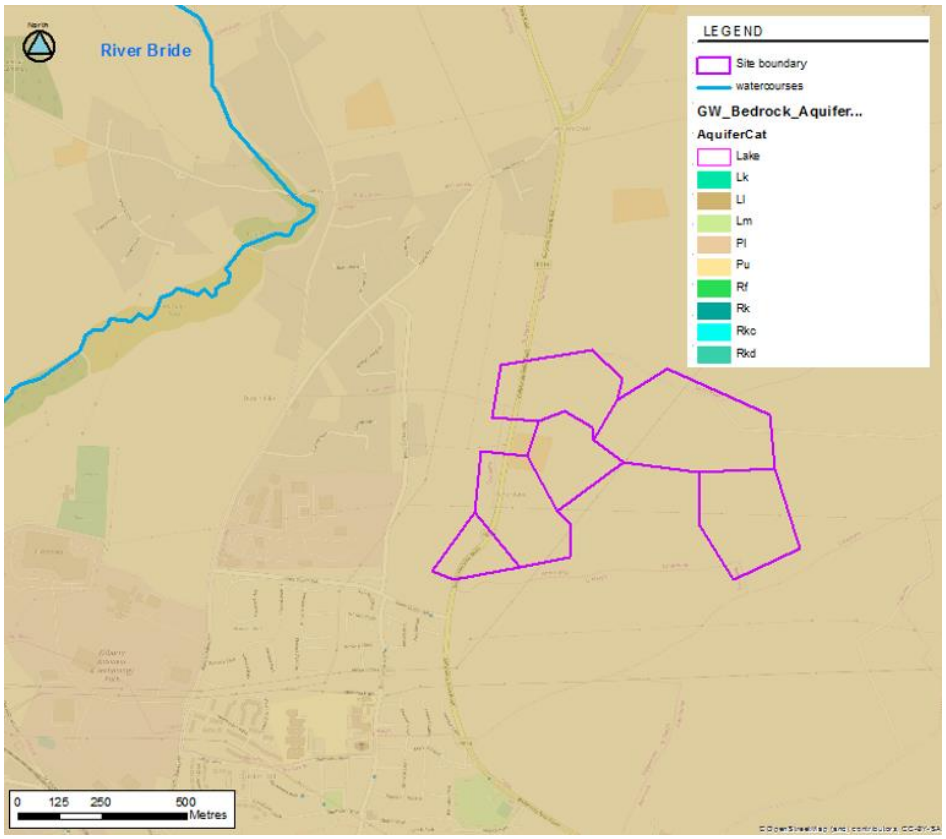
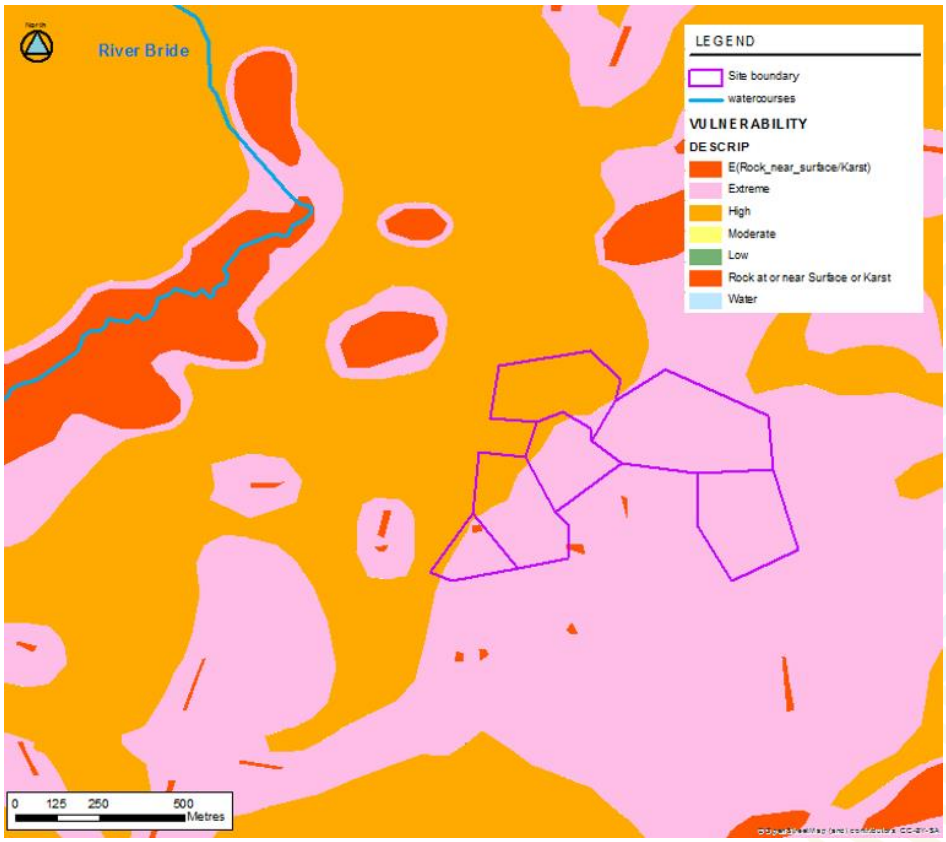


Figure 2-5 Aquifer Vulnerability



The regional groundwater flow direction is likely to echo that of topography and catchment drainage and, in the absence of more detailed groundwater level data, would be expected to be flowing south west to the River Bride. Locally to the site, groundwater is likely to flow from the higher ground in the east towards the depression west of the site.

Water was struck in the 2019 boreholes at various depths, ranging from 1-4.5 mbgl. Typically, levels did not rise or fall during drilling (Priority Geotechnical, 2019). An approximate groundwater level contour map is presented in Appendix C from these data and indicates that the overall gradient of the water table does indeed follow the general topography.

Since February 2019, water levels have generally fallen and become steady from March to April. In the south west part of the site, where most of the areas of cut are proposed, water levels have fallen by ~3m in RC01/RC02, but risen by 0.5 m in RC03.

In borehole RC03, the thickest sandy gravelly clay observed across the site (4.3 m) also suggests that the water table here is a perched one within the superficial deposits. In boreholes RC01/RC02 bedrock was much closer to the ground surface, with the fallen water levels suggesting that the upper bedrock is not particularly water-bearing. However, the degree of hydraulic connectivity with the underlying bedrock aquifer is unknown. Nonetheless, it may be the case that localised perched groundwater lenses exist within the more permeable horizons of the superficial deposits, and may have limited lateral extent.

The only other borehole where water levels have risen is RC09, located in the north west at the lowest elevation towards the river valley, where water levels are now close to ground surface. In this borehole, no bedrock was encountered and the water levels is likely to be that perched in permeable gravel deposits.

From Table 2-1, those areas which are more likely to experience groundwater seepage to this include the areas indicated in the south west by boreholes RC01, RC02 and RC04, where the indicative groundwater level may be above the new elevations at these locations following the cut and fill for the proposed development platforms.

Falling head tests were carried out on boreholes RC04/RC05/RC07 (2019) (Priority Geotechnical, 2019) (Appendix B). These boreholes are all screened in the bedrock and so are measuring bedrock groundwater. The permeability values obtained were:

- RC04 - $3.91*10^{-6}$ m/s (0.337 m/d);
- RC05 - $4.99*10^{-6}$ m/s (0.43 m/d); and
- RC07 - $8.89*10^{-5}$ m/s (7.68 m/d).

The average of these values is $3.26*10^{-5}$ m/s (2.8 m/d). These are moderate permeability values, typical of mudstone/sandstones with fractured. Pure sandstones would typically have a permeability value of an order of magnitude greater.

RC04/RC05 boreholes had ~1.5 m of superficial deposits overlying fractured bedrock to ~7mbgl, whilst borehole RC07 was shallower (4.5m) with more superficial deposits (2.5 m) and two sets of fractures were also observed within the underlying bedrock. As such, the order of magnitude difference perhaps relates to the greater thickness of superficial deposits.

Unconsolidated deposits with conductivity values in the order of 10^{-4} to 10^{-3} m/d are deemed to be Very Low to Low, and representative of massive clays and silt/clay/sand mixtures. As such, the overall permeability of the upper superficial deposits is likely to reflect the dominance of the gravelly clay substrate, and supports the hypothesis that those deposits which may contain groundwater are not laterally extensive, and support only limited perched aquifers.

Data has been obtained from readily available online sources. Site-specific data on groundwater levels are based upon the ground investigation that was undertaken in February 2019 which included two rounds of groundwater monitoring, completed in March and April 2019. It is possible that groundwater levels may vary seasonally in response to changing rainfall patterns.

2.6 Hydrogeological Conceptual Understanding

Based on the above information, the main features of the conceptual model are as follows:

- The mudstone/sandstone bedrock underlying the site does not constitute a reliable water-bearing aquifer that is capable of sustaining significant groundwater yields or flows. Nonetheless, groundwater may exist within the upper weathered bedrock, as evidenced by the existence of other wells in the vicinity of the site and the designation of the strata as a locally important aquifer. However, the connectivity of the bedrock with the overlying superficial deposits remains uncertain;
- The site is overlain by till, consisting of a combination of clays with sands and gravels. The thickness of the deposits varies across the site and is typically thinner on high ground. The deposits are highly heterogeneous, with layers of higher permeability deposits interleaved with those deposits containing higher proportions of low permeability silts/clays;
- Groundwater flow direction is from higher ground in the east towards lower ground in the west and south;
- Permeability values are typical of the bedrock type i.e. mudstones/sandstones with occasional fractures;
- Groundwater encountered within the superficial deposits appears to be perched in areas of till with more permeable gravels and sand within otherwise lower permeability clay. Groundwater typically exists at >6 mbgl. The lateral continuity of this near-surface groundwater is not known but is unlikely given the varying behaviour or groundwater level observed across the site; and
- It is considered that the likely supply mechanism for the water observed on site is not from a far-reaching catchment but from near-surface water, derived from rainwater infiltrating into upper layers of more permeable material, being perched above more clayey deposits. Groundwater levels have only been observed in late winter/early spring and are likely to be lower in summer.

3 Groundwater Flow Estimation

3.1 Consideration of Groundwater Recharge and Catchment Area

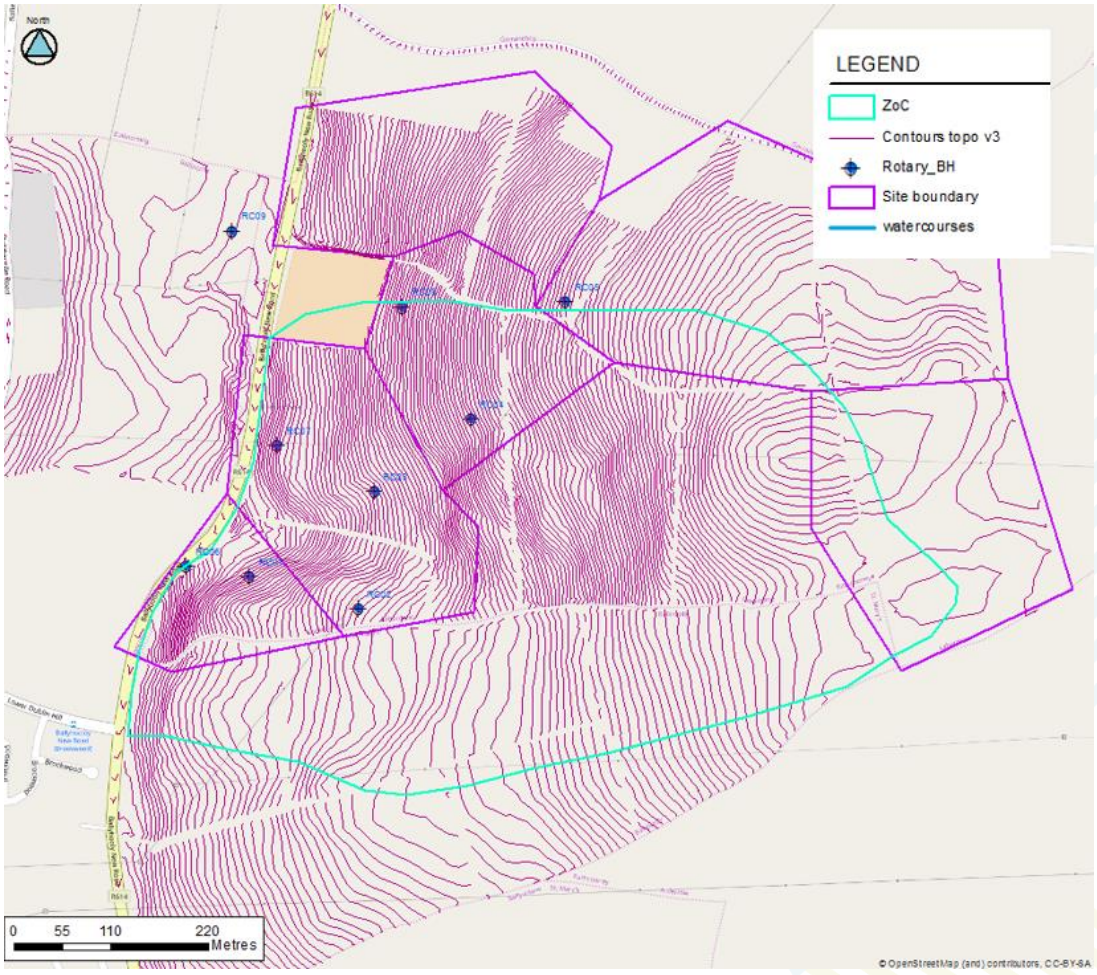
To provide a first estimate of the maximum potential groundwater flow to the site, a water balance exercise requires input of a number of scoping calculations. This can be achieved using various initial parameter values which best represent the conditions influencing the local groundwater balance. The key inputs are rainfall, evapotranspiration, runoff and catchment area. The GSI utilises such datasets to provide an estimation of recharge, and the maximum recharge capacity for the area of the site is 200 mm/yr.

With a value for groundwater recharge as depth over time it is then possible to calculate a volume over time (thus groundwater discharge), by approximating the area of recharge and using the equation:

Groundwater flow = recharge x estimated catchment area

The groundwater catchment area (or Zone of Contribution (ZoC)) has been determined manually (Table 3.1), using the maximum possible catchment as determined from both geological and topographical information (Figure 8). It is assumed that the zones of higher permeability sands and gravels within the till and upper fractured mudstone/sandstone comprise the water-bearing lithologies, therefore assuming a maximum catchment as this assumption will likely overestimate how extensive the 'aquifer' upgradient of the site is.

Figure 3-1 Zone of Contribution



The results for estimated groundwater recharge and the maximum groundwater flow from this recharge are shown in Table 3.1.

Table 3.1 Groundwater Recharge and Flow Calculations

Descriptor	Value	Unit	Origin
Groundwater recharge	**200**	mm/yr	Recharge = rainfall - actual evaporation - runoff
Groundwater catchment	**375,000**	m^2	ArcGIS polygon, manually created from topography/geology analysis
Maximum groundwater flow within catchment	**205 (1.1)**	m^3/day (l/s)	Volume = recharge x groundwater catchment
Maximum groundwater flow per m length	**0.4 (0.005)**	m^3/day (l/s)	Volume per meter length = max flow across catchment / 500m length along western boundary

The groundwater flow average estimate per meter length along the western downgradient boundary is therefore ~2 m^3/day. Nonetheless, this value is likely to overestimate flows given that the catchment area is (a) not entirely covered by till and (b) that the till and bedrock, which are not considered to be highly water-bearing aquifers, are not homogenous.

Furthermore, this value is unlikely to be achieved in reality as it assumes complete penetration of the water-bearing strata and that all water infiltrating the recharge zone upgradient of the site reaches the excavation area.

This value constitutes a worst-case estimate of the maximum potential natural yield, as these calculations assume no man-made interference e.g. variable permeability from other surrounding land uses such as the roadways and other housing developments. In reality, other factors may exist in the area to alter the water table and direction of flow, which will ultimately alter and limit the extent of groundwater catchment available to a given seepage face on the site. In addition, a fault lying immediately east of the upgradient extent of the catchment area may provide a barrier to regional groundwater flow, and limit that reaching the catchment.

3.2 Dewatering Calculations

An alternative way to consider the volume of water which may ingress at the excavation face along the base of an area of cut, for example, makes use of the UK Environment Agency's (EA) Tier 1 Analytical Tools, designed to assess the hydrogeological impact of dewatering abstractions, can be utilised.

The analysis tool used from the EA's Tier 1 assessment is the Trench With Flow One Side. This assumes partial penetration by a single row of well points of an unconfined aquifer fed from a single line source. This was used to represent flow from the excavation face.

On-site data for falling head tests completed for boreholes RC04, RC05 and RC07 established an average site permeability value of 2.8 m/d. Nonetheless, this represents only three locations within a spatially variable substrate, so groundwater inflow was also calculated using hydraulic conductivities for till and mudstone from established empirical estimates (0.1 m/d).

As a worst-case estimate, flow from the face was estimated using the mid-range permeability value for 'laminated sandstone, shale and mudstone' of $1x10^{-2}$ m/d^2. The

2 Table 1.1 of http://nora.nerc.ac.uk/id/eprint/7457/1/CR06160N.pdf

length of the "trench" is assumed to be the length of the western boundary of the site for Neighbourhoods 1 and 2, approximately 500 m.

The calculations also assume that the excavation wall (the cut face) is 4 m high, and that water level is approximately 3.5 m down from the original ground surface. If the radius of influence is deemed to be the length of the catchment calculated in section 3.1 (~750 m), the total discharge along the trench is 0.41 m^3/d. However, applying a much more realistic radius of influence of 100 m, the total discharge is ~2 m^3/d. This works out at 0.004 m^3/d per unit length of the trench.

Applying an upper range permeability estimate for the bedrock/superficial deposits, of 2.8 m/d from site data, the total discharge with 100 m radius is 92 m^3/d (1.06 l/s), and the discharge per unit length is therefore 0.184 m^3/d (0.002 l/s).

The analytical equations which have been used to determine groundwater discharge rates are based upon a number of assumptions, as follows:

- the hydraulic conductivity is constant across the entire area of the theoretical radius of influence. It is possible that hydraulic conductivity varies in response to changing ground conditions; and
- that groundwater levels and recharge are representative of the full year. It is possible that seasonal variability occurs for groundwater levels.

These assumptions may not be met on site. However, the discharge calculation has been undertaken in accordance with well-established hydrogeological principles and is sufficient for the purposes of this assessment. Nonetheless, on-site changes may occur due a range of variable conditions.

4 Conclusions and Recommendations

4.1 Conclusions

The proposed Longview Development is underlain by a thin layer of gravelly sandy clays, and underlain by Devonian mudstones and sandstones. The upper surface of the bedrock is likely to be uneven and weathered.

The water table was observed, from the ground investigation, to sit typically within the bedrock. Permeability testing indicates that this bedrock is of moderate permeability. The development requires areas of cut which may take the new ground level below the current groundwater table, and may pose problems with groundwater seepage onto the site. Groundwater discharge rates may be expected to range from 2-92 m^3/d in the south western part of the site, or 0.004-0.184 m^3/d (0.00004-0.0002 l/s) per unit length.

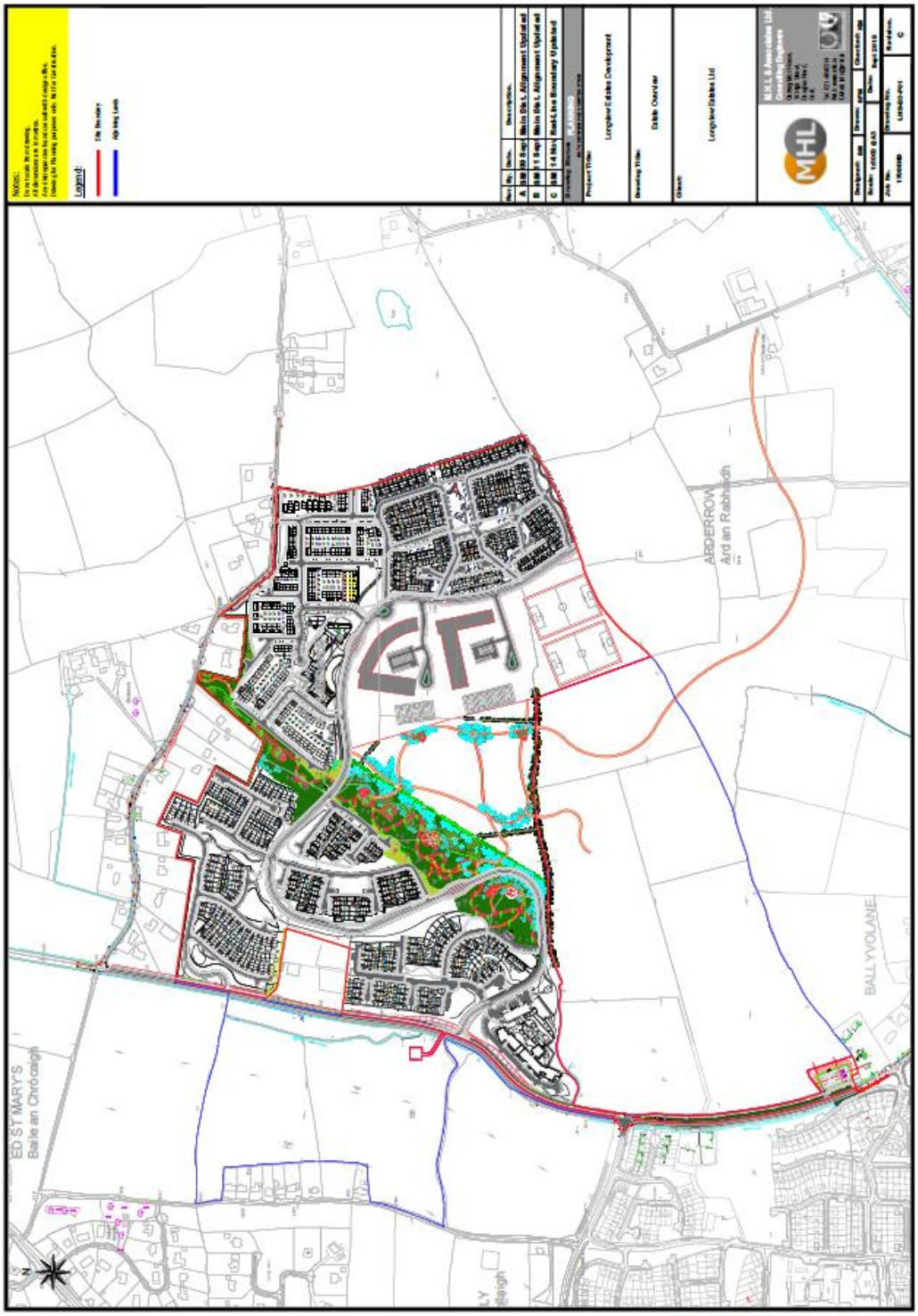
Nonetheless, there is so far no evidence of active groundwater discharge e.g. artesian conditions or upwelling.

In summary, the nature of the substrate is not highly water-bearing, and should be manageable by construction mitigation measures. In addition, permanent drainage solutions should be sought for long-term management of any potential seepage. Nonetheless, there are few data available to verify the nature and flow of groundwater within the site, which is likely to be variable across the site.

The conclusions of this desk study indicate that seepage is potentially likely to be an issue for the proposed development in areas of cut, where the local groundwater level may become close to the ground surface, at least in winter. Those areas more prone to this include the areas indicated in the south west by boreholes RC01, RC02 and RC04, where the indicative groundwater level may be above the new elevations at these locations following the cut and fill for the proposed development platforms.

Appendices

A Site Design Layout



B Borehole Logs and Permeability Tests (Priority Geotechnical)

Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie	Drilled By: GW Logged By: KH	Borehole No. **RC01** Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 568782E - 574962N	**Hole Type** Rotary cored
Location: Cork		**Level:** 75.07m OD	**Scale** 1:50
Client:		**Dates:** 16/02/2019	16/02/2019

Well	Water Strike (m)	Depth (m)	Type /Fs (min, max, avg)	Coring (%) TCR	SCR	RQD	Depth (m) / Fl (/m)	Level (mOD)	Legend	Stratum Description
										Open hole boring. Driller described: Slightly sandy gravelly Clay.
	▼	~~50 (25 for 10mm/50 for 0mm)~~ (C) 1.30 - 2.90	5mm 120mm 20mm	63	24	0	1.30 40/m	73.77		Lithology: Medium weak to medium strong, purple, SILTSTONE with common Sandstone bands. Weathering: Weathered to slightly weathered with oxidation and minor dissolution. Fractures: 1 set dipping circa 60 degrees with close spacing and planar rough surfaces.
		2.90 - 4.30	5mm 280mm 45mm	71	34	12	10/m 10/m			
		4.30 - 5.00	10mm 110mm 40mm	100	93	0	10/m			
		5.00 - 6.50	10mm 250mm 40mm 5mm 400mm 20mm	100	63	22	10/m			
							6.50	68.57		End of Borehole at 6.500m

1 2 3 4 5 6 7 8 9

Groundwater:

Struck (m bgl)	Rose to	After (min)	Sealed	Comment
1.30				See shift data.

Hole Information:

Hole Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)
6.50	76	131

Equipment:	Soilmec PSM
Method:	Compressed air mist.

Remarks:

RC01 terminated at 6.5m bgl. 50mm dia. standpipe installed. Response zone from 2.5m bgl to 6.5m bgl.

Shift Data:

Groundwater (m bgl)	Shift	Hole Depth (m bgl)	Remarks
	16/02/2019 08:00	0.00	Start of shift.
1.3	16/02/2019 18:00	6.50	End of borehole.

Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie	Drilled By: GW Logged By: KH	Borehole No. **RC02** Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 568905E - 574926N	**Hole Type** Rotary cored
Location: Cork		**Level:** 85.61m OD	**Scale** 1:50
Client:		**Dates:** 16/02/2019	16/02/2019

Well	Water Strike (m)	Depth (m)	Type /Fs (min, max, avg)	Coring (%) TCR	SCR	RQD	Depth (m) / Fl (/m)	Level (mOD)	Legend	Stratum Description
										Open hole boring. Driller described: Slightly sandy gravelly Clay.
	▼	~~50 (25 for 0mm/50 for 0mm)~~ (C)					1.40	84.21		
		1.50 - 3.00	10mm 160mm 70mm	100	82	19	1.50 10/m	84.11		Open hole boring. Driller described: Rock. Assumed Siltstone lithology. Lithology: Purple, fine to medium grained SANDSTONE with minor quartz veining and Siltstone lenses. Weathering: Slightly weathered with minor dissolution apparent and minor clay smearing along fracture surfaces. Fractures: 2 fracture sets observed.
		3.00 - 4.40	20mm 380mm 80mm	100	86	24	10/m			
		4.40 - 5.40	5mm 340mm 120mm	100	95	32	10/m			
		5.40 - 6.80	10mm 390mm 160mm	100	71	0	10/m			
			5mm 300mm 60mm				6.80	78.81		End of Borehole at 6.800m

Groundwater:

Struck (m bgl)	Rose to	After (min)	Sealed	Comment
1.50				See shift data.

Hole Information:

Hole Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)
6.80	76	131

Equipment:	Soilmec PSM
Method:	Compressed air mist.

Remarks:

RC02 terminated at 6.8m bgl. 59mm dia. standpipe installed. Response zone from 3.0m to 6.0m bgl.

Shift Data:

Groundwater (m bgl)	Shift	Hole Depth (m bgl)	Remarks
	16/02/2019 08:00	0.00	Start of shift.
1.5	16/02/2019 18:00	6.80	End of borehole.

Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie	Drilled By: GW Logged By: KH	Borehole No. **RC03** Sheet 1 of 2

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 568923E - 575059N	**Hole Type** Rotary cored
Location: Cork		**Level:** 80.99m OD	**Scale** 1:50
Client:		**Dates:** 17/02/2019	17/02/2019

Well	Water Strike (m)	Depth (m)	Type /Fs (min, max, avg)	Coring (%) TCR	SCR	RQD	Depth (m) / Fl (/m)	Level (mOD)	Legend	Stratum Description
		N=11 (3,3/2,3,2,4) (C)								Open hole boring. Driller described: Slightly sandy gravelly Clay.
		N=29 (3,4/6,6,8,9) (C)								
							4.30	76.69		Open hole boring. Driller described: Rock. Assumed Sandstone lithology.
		~~50 (25 for 40mm/50 for 70mm)~~ (C)					4.50	76.49		Lithology: Medium strong, purple, SANDSTONE with minor coarse lenses.
		4.50 - 6.00	10mm 260mm 60mm	67	53	19	10/m			Weathering: Slightly weathered with clay smearing along fracture surfaces and minor oxidation colouration.
		6.00 - 7.50	10mm 260mm 120mm	100	93	29	10/m			Fractures: Dipping 45 to 60 degrees with planar rough fracture surfaces and close to medium fracture spacing.
		7.50 - 8.00	100mm 420mm 340mm	100	100	64	6/m			
		8.00 - 9.50	20mm 530mm 280mm	100	100	93	9/m			

Groundwater:

Struck (m bgl)	Rose to	After (min)	Sealed	Comment
4.30				See shift data
7.50				

Hole Information:

Hole Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)
	76	131

Equipment:	Soilmec PSM
Method:	Compressed air mist.

Remarks:

RC03 terminated at 9.5m bgl. 50mm dia. standpipe installed. Response zone from 6.0m to 9..0m bgl.

Shift Data:

Groundwater (m bgl)	Shift	Hole Depth (m bgl)	Remarks
	17/02/2019 08:00	0.00	Start of shift.
7.5	17/02/2019 18:00	9.50	End of borehole.

Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie	Drilled By: GW Logged By: KH	Borehole No. **RC03** Sheet 2 of 2

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 568923E - 575059N	**Hole Type** Rotary cored
Location: Cork		**Level:** 80.99m OD	**Scale** 1:50
Client:		**Dates:** 17/02/2019	17/02/2019

Well	Water Strike (m)	Depth (m)	Type /Fs (min, max, avg)	Coring (%) TCR	SCR	RQD	Depth (m) / Fl (/m)	Level (mOD)	Legend	Stratum Description
							9.50	71.49		Lithology: Medium strong, purple, SANDSTONE with minor coarse lenses. Weathering: Slightly weathered with clay smearing along fracture surfaces and minor oxidation colouration. Fractures: Dipping 45 to 60 degrees with planar rough fracture surfaces and close to medium fracture spacing. End of Borehole at 9.500m

10 11 12 13 14 15 16 17 18

Groundwater:

Struck (m bgl)	Rose to	After (min)	Sealed	Comment
4.30				See shift data
7.50				

Hole Information:

Hole Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)
	76	131

Equipment:	Soilmec PSM
Method:	Compressed air mist.

Remarks:

RC03 terminated at 9.5m bgl. 50mm dia. standpipe installed. Response zone from 6.0m to 9..0m bgl.

Shift Data:

Groundwater (m bgl)	Shift	Hole Depth (m bgl)	Remarks
	17/02/2019 08:00	0.00	Start of shift.
7.5	17/02/2019 18:00	9.50	End of borehole.

Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie	Drilled By:	Borehole No. **RC04** Sheet 1 of 1
	Logged By: KH	

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 569033E - 575141N	**Hole Type** Rotary cored
Location: Cork		**Level:** 97.04m OD	**Scale** 1:50
Client:		**Dates:** 17/02/2019	17/02/2019

Well	Water Strike (m)	Depth (m)	Type /Fs (min, max, avg)	Coring (%) TCR	SCR	RQD	Depth (m) / FI (/m)	Level (mOD)	Legend	Stratum Description
										Open hole boring. Driller described: Slightly sandy gravelly Clay.
		~~N=36~~ (4,7/7,8,10,11) (C) 1.50 - 3.00	7mm 110mm 35mm	47	39	0	1.50 10/m	95.54		Lithology: Medium weak to medium strong, fine to medium grained SANDSTONE with minor clay bands. Weathering: Weathered with oxidation colouration and clay smearing along fracture surfaces. Fractures: 1 set dipping circa 60 degrees with planar fracture surfaces and close spacing.
	▼	~~50 (25 for 0mm/50 for 0mm)~~ (C) 3.00 - 4.50	5mm 180mm 50mm	97	93	0	10/m			
		4.50 - 5.20	8mm 460mm 70mm	100	100	53	10/m			
		5.20 - 6.70	12mm 290mm 160mm	100	97	25	8/m			
							6.70	90.34		End of Borehole at 6.700m

Groundwater:

Struck (m bgl)	Rose to	After (min)	Sealed	Comment
3.30				See shift data.

Hole Information:

Hole Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)
6.70		

Equipment:	Soilmec PSM
Method:	Compressed air mist.

Remarks:

RC04 terminated at 6.7m bgl. 50mm dia. standpipe installed. Response zone from 2.7m to 5.7m bgl. Falling head test carried out in borehole.

Shift Data:

Groundwater (m bgl)	Shift	Hole Depth (m bgl)	Remarks
3.3	07/02/2019 18:00	6.70	End of borehole.
	17/02/2019 08:00	0.00	Start of shift.

Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie	Drilled By: GW Logged By: KH	Borehole No. **RC05** Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 569140E - 575274N	**Hole Type** Rotary cored
Location: Cork		**Level:** 111.05m OD	**Scale** 1:50
Client:		**Dates:** 18/02/2019	18/02/2019

Well	Water Strike (m)	Depth (m)	Type /Fs (min, max, avg)	Coring (%) TCR	SCR	RQD	Depth (m) / FI (/m)	Level (mOD)	Legend	Stratum Description
							1.30	109.75		Open hole boring. Driller described: Slightly sandy gravelly Clay.
		~~50 (25 for 0mm/50 for 0mm)~~ (C) 1.50 - 2.50	15mm 160mm 80mm	100	40	0	1.50 10/m	109.55		Open hole boring. Driller described: Rock. Assumed Sandstone lithology. Lithology: Medium strong, purple, fine grained SANDSTONE with minor clay lenses. Weathering: Weathered with clay smearing and iron oxidation colouration. Fractures: Heavily fractured with close spacing, 60 degree dipping and planar rough fracture surfaces.
		2.50 - 3.50	10mm 310mm 120mm	100	80	12	10/m			
		3.50 - 4.50	5mm 230mm 80mm	100	71	0	10/m			
		4.50 - 5.50	12mm 280mm 160mm	100	78	0	10/m			
		5.50 - 6.50	5mm 180mm 70mm	100	74	0	10/m			
		6.50 - 7.50		100	90	0				
							7.50	103.55		End of Borehole at 7.500m

1 2 3 4 5 6 7 8 9

Groundwater:

Struck (m bgl)	Rose to	After (min)	Sealed	Comment
2.50				See shift data.

Hole Information:

Hole Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)
	76	131

Equipment:	Soilmec PSM
Method:	Compressed air mist

Remarks:

RC05 terminated at 7.5m bgl. 50mm dia. standpipe installed. Response zone from 2.0m to 5.0m bgl.

Shift Data:

Groundwater (m bgl)	Shift	Hole Depth (m bgl)	Remarks
	18/02/2019 08:00	0.00	Start of shift
2.5	18/02/2019 18:00	7.50	End of borehole.

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Drilled By:	Borehole No.
GW	**RC06**
Logged By:	Sheet 1 of 1
N/A	

Project Name:	Longview Developments	**Project No.** P19012	**Co-ords:** 568710E - 574974N	**Hole Type** Rotary open hole
Location:	Cork		**Level:** 65.82m OD	**Scale** 1:50
Client:			**Dates:** 16/02/2019	16/02/2019

Well	Water Strike (m)	Depth (m)	Type /Fs (min, max, avg)	Coring (%) TCR	SCR	RQD	Depth (m) / Fl (/m)	Level (mOD)	Legend	Stratum Description
	▼	50 (25 for 70mm/50 for 0mm) (C)					1.30	64.52		Open hole boring. Driller described: Slightly sandy gravelly Clay.
							3.30	62.52		Open hole boring. Driller described: Rock. Assumed Sandstone lithology.
										End of Borehole at 3.300m

1 2 3 4 5 6 7 8 9

Groundwater:

Struck (m bgl)	Rose to	After (min)	Sealed	Comment
1.30				See shift data.

Hole Information:

Hole Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)
3.30	100	131

Equipment:	Soilmec PSM
Method:	Compressed air mist.

Remarks:

RC06 terminated at 3.3m bgl. 50mm dia. standpipe installed. Response zone from 1.3m bgl to 3.3m bgl.

Shift Data:

Groundwater (m bgl)	Shift	Hole Depth (m bgl)	Remarks
	16/02/2019 08:00	0.00	Start of shift
1.3	16/02/2019 18:00	3.30	End of borehole.

Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie	Drilled By: GW Logged By: KH	Borehole No. **RC07** Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 568813E - 575111N	**Hole Type** Rotary cored
Location: Cork		**Level:** 74.03m OD	**Scale** 1:50
Client:		**Dates:** 17/02/2019	17/02/2019

Well	Water Strike (m)	Depth (m)	Type /Fs (min, max, avg)	Coring (%) TCR	SCR	RQD	Depth (m) / Fl (/m)	Level (mOD)	Legend	Stratum Description
		N=31 (3,5/8,6,8,9) (C)								Open hole boring. Driller described: Slightly sandy gravelly Clay.
		~~50 (25 for 20mm/50 for 40mm)~~ (C) 2.50 - 3.50		70	52	15	2.50	71.53		Lithology: Medium weak, purple, medium grained SANDSTONE with minor pyrite minerals. Weathering: Weathered with oxidation colouration and minor dissolution along bedding planes. Fractures: 2 sets observed.
		3.50 - 4.50		85	75	12				
							4.50	69.53		End of Borehole at 4.500m

Groundwater:

Struck (m bgl)	Rose to	After (min)	Sealed	Comment
3.00				See shift data.

Hole Information:

Hole Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)
4.50	76	131

Equipment:	Soilmec PSM
Method:	Compressed air mist.

Remarks:

RC07 terminated at 4.5m bgl. 50mm dia. standpipe installed. Response zone from 2.5m to 4.5m bgl.

Shift Data:

Groundwater (m bgl)	Shift	Hole Depth (m bgl)	Remarks
	17/02/2019 08:00	0.00	Start of shift
3.0	17/02/2019 18:00	4.50	End of borehole.

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Drilled By:	Borehole No.
GW	**RC08**
Logged By:	Sheet 1 of 1
KH	

Project Name:	Longview Developments	**Project No.** P19012	**Co-ords:**	568955E - 575268N	**Hole Type** Rotary cored
Location:	Cork		**Level:**	88.82m OD	**Scale** 1:50
Client:			**Dates:**	18/02/2019	18/02/2019

Well	Water Strike (m)	Depth (m)	Type /Fs (min, max, avg)	Coring (%) TCR	SCR	RQD	Depth (m) / Fl (/m)	Level (mOD)	Legend	Stratum Description
										Open hole boring. Driller described: Slightly sandy gravelly Clay.
		~~50 (25 for 0mm/50 for 0mm)~~ (C) 1.50 - 2.50	4mm 170mm 60mm	100	43	0	1.50 10/m	87.32		Lithology: Green, medium to coarse grained SANDSTONE with quartz veining. Weathering: Weathered with iron oxide colouration throughout. Fractures: Heavily fractures throughout.
		2.50 - 3.50	5mm 130mm 70mm	80	34	0	10/m 3.50	85.32		End of Borehole at 3.500m

Groundwater:

Struck (m bgl)	Rose to	After (min)	Sealed	Comment
1.50				See shift data

Hole Information:

Hole Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)
3.50	76	131

Equipment:	Soilmec PSM
Method:	Compressed air mist.

Remarks:

RC08 terminated at 3.5m bgl. 50mm dia. standpipe installed. Response zone from 1.5m to 3.5m bgl.

Shift Data:

Groundwater (m bgl)	Shift	Hole Depth (m bgl)	Remarks
	18/02/2019 08:00	0.00	Start of shift.
1.5	18/02/2019 18:00	3.50	End of borehole.

Priority Geotechnical Ltd. Tel: 021 4631600 Fax: 021 4638690 www.prioritygeotechnical.ie	Drilled By: GW Logged By: N/A	Borehole No. **RC09** Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 568762E - 575354N	**Hole Type** Rotary cored
Location: Cork		**Level:** 70.77m OD	**Scale** 1:50
Client:		**Dates:** 18/02/2019	18/02/2019

Well	Water Strike (m)	Depth (m)	Type /Fs (min, max, avg)	Coring (%) TCR	SCR	RQD	Depth (m) / Fl (/m)	Level (mOD)	Legend	Stratum Description
							0.80	69.97		Open hole boring. Driller described: Slightly sandy peaty Clay.
	▼	N=17 (2,3/3,5,4,5) (C)								Open hole boring. Driller described: Sandy Gravel.
		N=20 (3,4/4,5,5,6) (C)					3.00	67.77		End of Borehole at 3.000m

1 2 3 4 5 6 7 8 9

Groundwater:

Struck (m bgl)	Rose to	After (min)	Sealed	Comment
1.07				See shift data

Hole Information:

Hole Depth (m bgl)	Hole Dia (mm)	Casing Dia (mm)
3.00	131	131

Equipment:	Soilmec PSM
Method:	Compressed air mist.

Remarks:

RC09 terminated at 3.0m bgl. 50mm dia. standpipe installed. Response zone from 1.0m to 3.0m bgl.

Shift Data:

Groundwater (m bgl)	Shift	Hole Depth (m bgl)	Remarks
	18/02/2019 08:00	0.00	Start of shif
1.07	18/02/2019 18:00	3.00	End of borehole.

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TP01
Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 568923E - 575176N **Level:** 84.98m OD	**Date** 14/02/2019
Location: Cork		**Dimensions (m):** 3.00 x 2.00 **Depth:** 2.10m BGL	**Scale** 1:25
Client:			**Logged** DMC

Water Strike & Backfill	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
				0.35	84.63		(TOPSOIL): Soft brown slightly sandy slightly gravelly SILT. Sand is fine to coarse. Sand is fine to coarse. Gravel is fine to coarse, sub-angular.
	0.50 - 1.00 0.50 - 1.00	B D					Orange brown very gravelly SILT. Gravel is fine to coarse, angular.
				1.20	83.78		Green SILTSTONE bedrock dipping 75 degrees, striking E-W. Recovered as: Angular and tabular COBBLES.
	1.50 - 2.00	B					
				2.10	82.88		End of Pit at 2.100m

1
2
3
4
5

Stability: Moderate
Plant: 13T track machine
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Trial pit terminated at 2.10m bgl due to rock.

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TP02
Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 568962E - 575104N **Level:** 86.68m OD	**Date** 14/02/2019
Location: Cork		**Dimensions (m):** 3.00 x 2.00 **Depth:** 3.00m BGL	**Scale** 1:25
Client:			**Logged** DMC

Water Strike & Backfill	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
							TOPSOIL.
				0.30	86.38		
	0.50 - 1.20	B					Soft orange brown slightly sandy gravelly SILT. Sand is fine to coarse. Gravel is fine to coarse, sub-angular.
	0.50 - 1.20	D					
				1.30	85.38		
	1.50 - 2.20	B					Stiff brown slightly sandy very gravelly SILT with high cobble content. Sand is fine to coarse. Gravel is fine to coarse, sub-angular to rounded. Cobbles are 63mm to 200mm dia, sub-angular to rounded, Limestone.
	1.50 - 2.20	D					
				2.40	84.28		
	2.50 - 3.00	B					ROCK. Recovered as brown green blocky Sandstone Cobbles and Boulders
				3.00	83.68		End of Pit at 3.000m

Stability:
Plant: 13T track machine
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Trial pit terminated at 3.00m bgl due to rock.

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TP03
Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 569001E - 574968N **Level:** 88.63m OD	**Date** 14/02/2019
Location: Cork		**Dimensions (m):** 3.00 x 2.00 **Depth:** 3.40m BGL	**Scale** 1:25
Client:			**Logged** DMC

Water Strike & Backfill	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
							(TOPSOIL).
				0.30	88.33		
	0.50 - 1.20	B					Orange, brown, soft, gravelly SILT. Gravel is fine to coarse.
	0.50 - 1.20	B					
	0.50 - 1.20	D					
				1.20	87.43		
	1.50 - 2.50	B					Brown, soft, very gravelly clayey SILT with high cobble content with high boulder content. Cobbles are 63mm to 200mm dia, angular, siltstone. Boulders are 200mm to 500mm dia, angular.
	1.50 - 2.50	B					
	1.50 - 2.50	D					
				2.80	85.83		
	3.00 - 3.40	B					SILTSTONE. Recovered as cobbles & boulders of green siltstone.
				3.40	85.23		End of Pit at 3.400m

1
2
3
4
5

Stability: Moderate.
Plant: 13 Tonne Track Machine.
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Trial pit terminated at 3.40m bgl due to rock.

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TP04
Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 568848E - 574965N **Level:** 80.10m OD	**Date** 14/02/2019
Location: Cork		**Dimensions (m):** 3.00 x 2.00 **Depth:** 3.40m BGL	**Scale** 1:25
Client:			**Logged** DMC

Water Strike & Backfill	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
							(TOPSOIL).
				0.30	79.80		Red, soft, very gravelly CLAY with high cobble content. Gravel is fine to coarse, angular. Cobbles are 63mm to 150mm dia, angular to sub-angular, sandstone.
	0.50 - 2.00	B					
	0.50 - 2.00	B					
				2.40	77.70		SILTSTONE. Rock recovered as cobbles & boulders of green siltstone.
	2.50 - 3.40	B					
				3.40	76.70		End of Pit at 3.400m

Stability: Moderate.
Plant: 13 Tonne Track Machine.
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Trial pit terminated 3.40m bgl due to rock.

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TP05
Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 568930E - 575025N **Level:** 81.67m OD	**Date** 14/02/2019
Location: Cork		**Dimensions (m):** 3.50 × 2.00	**Scale** 1:25
Client:		**Depth:** 2.90m BGL	**Logged** DMC

Water Strike & Backfill	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
							(TOPSOIL).
				0.30	81.37		
	0.50 - 1.00 0.50 - 1.00	B B					Orange, brown, soft, slightly sandy slightly gravelly SILT. Sand is fine to coarse. Gravel is fine to coarse, sub-angular.
	1.00 - 1.80 1.00 - 1.80	B B		1.00	80.67		Brown, purple, soft, slightly sandy very gravelly CLAY/ SILT with medium cobble content. Cobbles are 63mm to 200mm dia, angular to sub-angular, sandstone.
				1.80	79.87		COBBLES & BOULDERS. Rock recovered as angular tabular cobbles and boulders of green/pink weathered siltstone/sandstone.
	2.00 - 2.90	B					
				2.90	78.77		End of Pit at 2.900m

1 2 3 4 5

Stability: Moderate.
Plant: 13 Tonne Track Machine.
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Trial pit terminated at 2.90m bgl due to rock.

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TP06
Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 568872E - 574999N **Level:** 78.00m OD	**Date** 14/02/2019
Location: Cork		**Dimensions (m):** 3.50 x 2.00 **Depth:** 2.10m BGL	**Scale** 1:25
Client:			**Logged** DMC

Water Strike & Backfill	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
							(TOPSOIL)
	0.40 - 0.90 0.40 - 0.90 0.40 - 0.90	B B D		0.40	77.60		Orange, brown, soft, gravelly SILT with high cobble content. Gravel is fine to coarse, angular to sub-angular. Cobbles are 63mm to 150mm dia, angular to sub-angular, sandstone.
	1.00 - 2.00	B		0.90	77.10		SILTSTONE. Rock recovered as cobbles and boulders of green siltstone.
				2.10	75.90		End of Pit at 2.100m

Stability: Moderate.
Plant: 13 Tonne Track Machine.
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Trial pit terminated at 2.10m bgl due to rock.

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TP07
Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 568884E - 575142N **Level:** 79.64m OD	**Date** 14/02/2019
Location: Cork		**Dimensions (m):** 3.20 × 2.00	**Scale** 1:25
Client:		**Depth:** 3.50m BGL	**Logged** DMC

Water Strike & Backfill	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
				0.30	79.34		(TOPSOIL)
				0.75	78.89		Orange, brown, soft, slightly sandy slightly gravelly SILT. Sand is fine to coarse. Gravel is fine to coarse, sub-angular.
	0.80 - 1.80 0.80 - 1.80	B B					Red, soft to firm, very gravelly CLAY with high cobble content. Gravel is fine to coarse. Cobbles are 63mm to 120mm dia, angular to sub-angular, siltstone.
	1.90 - 2.50 1.90 - 2.50	B B		1.90	77.74		SILTSTONE. Rock recovered as angular pink siltstone gravel, cobbles & boulders. Boulder size increasing with depth.
	3.00 - 3.50	B					
				3.50	76.14		End of Pit at 3.500m

Stability: Moderate.
Plant: 13 Tonne Track Machine.
Backfill: Arisings.

Groundwater: Slow flow.

Remarks: Trial terminated at 3.50m bgl due to obstruction.

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TP08
Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 568761E - 575006N **Level:** 69.70m OD	**Date** 14/02/2019
Location: Cork		**Dimensions (m):** 3.00 × 2.00 **Depth:** 1.80m BGL	**Scale** 1:25
Client:			**Logged** DMC

Water Strike & Backfill	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
				0.30	69.40		(TOPSOIL)
	0.50 - 1.00 0.50 - 1.00	B B					Brown, purple, slightly sandy gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, sub-angular. Cobbles are 63mm to 150mm dia, angular to sub-angular.
	1.20 - 1.80	B		1.10	68.60		SANDSTONE. Rock recovered as blocky cobbles and boulders of sandstone.
				1.80	67.90		End of Pit at 1.800m

Stability: Moderate.
Plant: 13 Tonne Track Machine.
Backfill: Arisings.

Groundwater: Slow flow.

Remarks: Trial pit terminated at 1.80m bgl due to rock.

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TP09
Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 568854E - 575165N **Level:** 76.43m OD	**Date** 14/02/2019
Location: Cork		**Dimensions (m):** 3.00 x 2.00 **Depth:** 3.20m BGL	**Scale** 1:25
Client:			**Logged** DMC

Water Strike & Backfill	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
				0.30	76.13		(TOPSOIL)
	0.50 - 1.00 0.50 - 1.00	B D					Purple, brown, soft, sandy SILT. Sand is fine to coarse.
	1.00 - 1.70 1.00 - 1.70 1.00 - 1.70	B B D		1.00	75.43		Purple, brown, soft, slightly sandy very gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, sub-angular. Cobbles are 63mm to 120mm dia, sub-angular, sandstone.
▼				1.70	74.73		Cream, mottled black, firm, sandy very gravelly SILT. Sand is fine to coarse. Gravel is fine to coarse, sub-angular.
	2.00 - 2.80 2.00 - 2.80 2.00 - 2.80	B B D					
	2.90 - 3.20	B		2.90	73.53		SILTSTONE. Rock recovered as angular pink gravel and cobbles of siltstone.
				3.20	73.23		End of Pit at 3.200m

Stability: Moderate.
Plant: 13 Tonne Track Machine.
Backfill: Arisings.

Groundwater: Trickling flow.

Remarks: Trial pit terminated at 3.20m bgl due to obstruction.

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TP10
Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 568808E - 575193N **Level:** 71.02m OD	**Date** 14/02/2019
Location: Cork		**Dimensions (m):** 3.30 × 2.50 **Depth:** 3.60m BGL	**Scale** 1:25
Client:			**Logged** DMC

Water Strike & Backfill	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
							(TOPSOIL)
				0.40	70.62		
	0.50 - 1.50	B					Brown, soft, slightly sandy slightly slightly gravelly SILT. Sand is fine to coarse. Gravel is fine to coarse, sub-angular.
	0.50 - 1.50	B					
	0.50 - 1.50	D					
				1.60	69.42		
							Brown, purple, soft, very gravelly clayey SILT. Gravel is fine to coarse, angular to sub-angular.
	2.00 - 2.70	B					
	2.00 - 2.70	B					
	2.00 - 2.70	D					
				2.70	68.32		
	2.80 - 3.60	B					SILTSTONE. Recorded as pink angular gravel and cobbles.
▼							
				3.60	67.42		End of Pit at 3.600m

Stability: Moderate.
Plant: 13 Tonne Track Machine.
Backfill: Arisings.

Groundwater: Slow flow.

Remarks: Trial pit terminated at 3.60m bgl due to rock.

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TP11
Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 569022E - 575247N **Level:** 98.34m OD	**Date** 15/02/2019
Location: Cork		**Dimensions (m):** 3.50 x 2.50 **Depth:** 3.00m BGL	**Scale** 1:25
Client:			**Logged** DMC

Water Strike & Backfill	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
							(TOPSOIL)
	0.40 - 0.90 0.40 - 0.90 0.40 - 0.90	B B D		0.40	97.94		Orange, brown, soft, slightly sandy slightly gravelly SILT. Sand is fine to coarse. Gravel is fine to medium.
	1.00 - 3.00	B		0.90	97.44		COBBLES & BOULDERS. Angular blocks of sandstone.
				3.00	95.34		End of Pit at 3.000m

Stability: Moderate.
Plant: 13 Tonne Track Machine.
Backfill: Arisings.
Groundwater: None encountered.
Remarks: Trial pit terminated at 3.00m bgl due to rock.

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TP12
Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 569036E - 575319N **Level:** 98.68m OD	**Date** 15/02/2019
Location: Cork		**Dimensions (m):** 3.00 × 2.20 **Depth:** 2.40m BGL	**Scale** 1:25
Client:			**Logged** DMC

Water Strike & Backfill	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
				0.30	98.38		(TOPSOIL)
	0.50 - 1.50 0.50 - 1.50	B B					Brown, soft, very gravelly SILT with high cobble content with high boulder content. Gravel is fine to coarse, sub-angular. Cobbles & boulders are angular sandstone.
▼				1.50	97.18		Slightly gravelly slightly clayey BOULDERS with high cobble content. Cobbles & boulders are angular green siltstone.
	2.00 - 2.40 2.00 - 2.40	B B					
				2.40	96.28		End of Pit at 2.400m

Stability: Moderate.
Plant: 13 Tonne Track Machine.
Backfill: Arisings.
Groundwater: Slow flow.
Remarks: Trial pit terminated at 2.40m due to rock.

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TP13
Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 568917E - 575422N **Level:** 80.10m OD	**Date** 15/02/2019
Location: Cork		**Dimensions (m):** 3.50 × 2.20 **Depth:** 2.50m BGL	**Scale** 1:25
Client:			**Logged** DMC

Water Strike & Backfill	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
				0.40	79.70		(TOPSOIL)
	0.50 - 1.50 0.50 - 1.50 0.50 - 1.50	B B B					Brown, soft, slightly sandy very gravelly SILT with high cobble content. Sand is fine to coarse. Gravel is fine to coarse, sub-angular. Cobbles are 63mm to 120mm dia, angular.
				1.60	78.50		ROCK. Recovered as pink tabular angular cobbles & boulders of siltstone dipping sub-vertical.
	2.00 - 2.50 2.00 - 2.50	B B					
				2.50	77.60		End of Pit at 2.500m

1 2 3 4 5

Stability: Moderate.
Plant: 13 Tonne Track Machine.
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Trial pit terminated at 2.50m bgl due to obstruction.

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TP14
Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 569030E - 575394N **Level:** 94.29m OD	**Date** 15/02/2019
Location: Cork		**Dimensions (m):** 3.00 × 2.50	**Scale** 1:25
Client:		**Depth:** 2.50m BGL	**Logged** DMC

Water Strike & Backfill	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
							(TOPSOIL)
	0.50 - 1.50 0.50 - 1.50 0.50 - 1.50	B B B		0.40	93.89		Brown, soft, slightly sandy very gravelly SILT with high cobble content. Cobbles are 63mm to 200mm dia, angular to sub-angular, siltstone.
	1.80 - 2.50	B		1.60	92.69		COBBLES & BOULDERS. Recovered as pink angular tabular cobbles & boulders, 200mm to 400mm dia.
				2.50	91.79		End of Pit at 2.500m

Stability: Moderate.
Plant: 13 Tonne Track Machine.
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Trial pit terminated at 2.50m bgl due to obstruction.

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TP15
Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 569114E - 575398N **Level:** 103.60m OD	**Date** 15/02/2019
Location: Cork		**Dimensions (m):** 3.20 × 2.00 **Depth:** 2.90m BGL	**Scale** 1:25
Client:			**Logged** DMC

Water Strike & Backfill	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
				0.40	103.20		(TOPSOIL)
	0.50 - 1.70 0.50 - 1.70	B B					Brown, soft, gravelly SILT with high cobble content. Gravel is fine to coarse, sub-angular. Cobbles are angular to sub-angular, siltstone.
				1.75	101.86		COBBLES. Recovered as pink angular tabular cobbles of Mudstone/Siltstone.
	2.00 - 2.90 2.00 - 2.90	B B					
				2.90	100.70		End of Pit at 2.900m

1 2 3 4 5

Stability: Moderate.
Plant: 13 Tonne Track Machine.
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Trial pit terminated at 2.90m bgl due to rock.

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TP16
Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 569563E - 575058N **Level:** 127.27m OD	**Date** 15/02/2019
Location: Cork		**Dimensions (m):** 3.00 x 2.00 **Depth:** 2.40m BGL	**Scale** 1:25
Client:			**Logged** DMC

Water Strike & Backfill	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
							(TOPSOIL)
				0.40	126.87		Purple, brown, soft, slightly gravelly SILT. Gravel is fine to coarse, sub-angular.
	1.00 - 2.00 1.00 - 2.00	B B		0.90	126.37		Brown, soft, very gravelly clayey SILT with high cobble content. Gravel is fine to coarse, sub-angular. Cobbles are 63mm to 200m dia, angular to sub-angular.
	2.00 - 2.40	B		2.00	125.27		COBBLES & BOULDERS. Recovered as angular blocks of brown/green cobbles & boulders of sandstone.
▼				2.40	124.87		End of Pit at 2.400m

1
2
3
4
5

Stability: Good.
Plant: 13 Tonne Track Machine.
Backfill: Arisings.

Groundwater: Slow flow.

Remarks: Trial pit terminated at 2.40m bgl due to rock.

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TP17
Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 569676E - 574955N **Level:** 127.70m OD	**Date** 15/02/2019
Location: Cork		**Dimensions (m):** 3.00 × 2.00	**Scale** 1:25
Client:		**Depth:** 2.70m BGL	**Logged** DMC

Water Strike & Backfill	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
				0.40	127.30		(TOPSOIL)
							Brown, slightly gravelly SILT. Gravel is fine to coarse.
	1.00 - 2.00 1.00 - 2.00	B B		1.00	126.70		Brown, very gravelly CLAY with high cobble content. Cobbles are 63mm to 200mm dia, angular, siltstone.
	2.30 - 2.70	B		2.30	125.40		COBBLES. Recovered as angular cobbles of siltstone.
▼				2.70	125.00		End of Pit at 2.700m

1
2
3
4
5

Stability: Moderate.
Plant: 13 Tonne Track Machine.
Backfill: Arisings.

Groundwater: Slow flow.

Remarks: Trial pit terminated at 2.70m bgl due to rock.

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TP18
Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 569586E - 575249N **Level:** 126.65m OD	**Date** 15/02/2019
Location: Cork		**Dimensions (m):** 3.50 × 2.20 **Depth:** 2.90m BGL	**Scale** 1:25
Client:			**Logged** DMC

Water Strike & Backfill	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
							(TOPSOIL)
	0.50 - 1.50	B		0.40	126.25		COBBLES & BOULDERS. Rock recovered as cobbles & boulders.
	2.00 - 2.90	B					
				2.90	123.75		End of Pit at 2.900m

1
2
3
4
5

Stability: Moderate.
Plant: 13 Tonne Track Machine.
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Trial pit terminated at 2.90m bgl due to competent rock.

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TP19
Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 569512E - 574922N **Level:** 127.70m OD	**Date** 19/02/2019
Location: Cork		**Dimensions (m):** 2.50 × 1.30	**Scale** 1:25
Client:		**Depth:** 1.90m BGL	**Logged** AO

Water Strike & Backfill	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
	0.60 - 1.00	B		0.60	127.10		(TOPSOIL). Brown, clayey slightly gravelly SAND with high cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular, siltstone. Cobbles are angular, siltstone.
	1.50 - 1.90	B		1.90	125.80		Brown, slightly clayey slightly sandy GRAVEL with high cobble content. Gravel is fine to coarse, angular. Cobbles are angular, siltstone.
							End of Pit at 1.900m

1
2
3
4
5

Stability: Moderate.
Plant: 13 Tonne Track Machine
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Trial pit terminated 1.90m bgl due to bedrock.

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TP20
Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 569446E - 575181N **Level:** 128.24m OD	**Date** 19/02/2019
Location: Cork		**Dimensions (m):** 2.50 x 1.30	**Scale** 1:25
Client:		**Depth:** 2.50m BGL	**Logged** AO

Water Strike & Backfill	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
							(TOPSOIL). Dark brown, clayey gravelly SAND.
	0.50 - 1.00	B		0.40	127.84		Orange, brown, slightly clayey, slightly sandy GRAVEL with high cobble content with low boulder content. Sand is fine to coarse. Gravel is angular, siltstone. Boulders are 200mm to 400mm dia, siltstone.
	1.50 - 2.00	B					
				2.10	126.14		COBBLES & BOULDERS. Recovered as weathered angular siltstone bedrock of cobbles & boulders.
				2.50	125.74		End of Pit at 2.500m

Stability: Moderate.
Plant: 13 Tonne Track Machine.
Backfill: Arisings.

Groundwater: None encountered.

Remarks: Trial pit terminated at 2.50m bgl due to bedrock.

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TP21
Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 568758E - 575330N **Level:** 69.92m OD	**Date** 19/02/2019
Location: Cork		**Dimensions (m):** 3.00 x 1.50 **Depth:** 3.50m BGL	**Scale** 1:25
Client:			**Logged** AO

Water Strike & Backfill	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
							(TOPSOIL). Dark brown, organic, slightly sandy slightly gravelly CLAY.
				0.60	69.32		
▼	1.00 - 1.50	B					Purple, slightly silty sandy GRAVEL with low cobble content. Gravel is fine to coarse, sub-angular to rounded, sandstone/siltstone. Cobbles are sub-angular to rounded, sandstone/siltstone.
	2.00 - 2.50	B					
				2.50	67.42		Purple, silty slightly gravelly SAND with low cobble content. Sand is fine to medium. Gravel is fine to coarse, sub-angular to rounded, sandstone/siltstone.
	3.00 - 3.50	B					
				3.50	66.42		End of Pit at 3.500m

Stability: Poor.
Plant: 13 Tonne Track Machine.
Backfill: Arisings.

Groundwater: Steady flow.

Remarks: Trial pit terminated at 3.50m bgl due to pit wall instability.

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TP22
Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 568789E - 575278N **Level:** 69.38m OD	**Date** 19/02/2019
Location: Cork		**Dimensions (m):** 3.50 x 1.50 **Depth:** 3.60m BGL	**Scale** 1:25
Client:			**Logged** AO

Water Strike & Backfill	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
				0.30	69.08		(TOPSOIL). Brown, clayey, slightly gravelly SAND.
	0.50 - 1.00	B					Pale purple, clayey sandy GRAVEL with low cobble content. Gravel is fine to coarse, sub-angular to rounded, sandstone. Cobbles are sub-angular to rounded, sandstone.
				1.00	68.38		Purple, clayey sandy GRAVEL. Gravel is fine to coarse, angular to sub-rounded, sandstone/siltstone.
				1.20	68.18		Red/brown, clayey, sandy GRAVEL with high cobble content. Sand is fine to coarse. Gravels are angular to sub-angular, sandstone/siltstone.
	1.50 - 2.00	B					
				3.60	65.78		End of Pit at 3.600m

1 2 3 4 5

Stability: Moderate.
Plant: 13 Tonne Track Machine.
Backfill: Arisings.

Groundwater: Steady flow.

Remarks: Trial pit terminated at 3.60m bgl due to bedrock.

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TP23
Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 568807E - 575376N **Level:** 70.97m OD	**Date** 19/02/2019
Location: Cork		**Dimensions (m):** 3.00 x 2.00 **Depth:** 3.50m BGL	**Scale** 1:25
Client:			**Logged** AO

Water Strike & Backfill	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
				0.20	70.77		(TOPSOIL). Brown, slightly organic sllghtly gravelly CLAY.
				0.40	70.57		Orange, soft, slightly organic slightly sandy slightly gravelly CLAY.
	0.50 - 1.00	B					Grey, brown, soft, slightly organic slightly sandy slightly gravelly CLAY with low cobble content. Cobbles are sub-angular, sandstone/siltstone.
▼	0.80	D					
				1.00	69.97		Purple, brown, slightly clayey, sandy GRAVEL with high cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to sub-angular, sandstone/siltstone. Cobbles are sub-angular, sandstone/siltstone.
	1.50 - 2.00	B					
				3.50	67.47		End of Pit at 3.500m

1 2 3 4 5

Stability: Poor.
Plant: 13 Tonne Track Machine.
Backfill: Arisings.

Groundwater: Steady flow.

Remarks: Trial pit terminated at 3.50m bgl due to pit wall instability.

Priority Geotechnical Ltd.
Tel: 021 4631600
Fax: 021 4638690
www.prioritygeotechnical.ie

Trial Pit No
TP24
Sheet 1 of 1

Project Name: Longview Developments	**Project No.** P19012	**Co-ords:** 568776E - 575386N **Level:** 70.87m OD	**Date** 19/02/2019
Location: Cork		**Dimensions (m):** 3.50 x 1.50 **Depth:** 3.50m BGL	**Scale** 1:25
Client:			**Logged** AO

Water Strike & Backfill	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
				0.40	70.47		(TOPSOIL). Brown, organic slightly sandy slightly gravelly CLAY.
				0.60	70.27		Light grey, soft, slightly organic slightly sandy slightly gravelly CLAY.
▼	1.00 - 1.50	B					Purple, brown, slightly silty sandy GRAVEL with medium cobble content. Cobbles are sub-angular, sandstone/siltstone.
▼	2.50 - 3.00	B		2.20	68.67		Purple, brown, silty slightly gravelly SAND with low cobble content. Gravel is fine to coarse, sub-angular to sub-rounded, sandstone/siltstone. Cobbles are sub-angular to sub-rounded, sandstone/siltstone.
				3.50	67.37		End of Pit at 3.500m

1 2 3 4 5

Stability: Poor.
Plant: 13 Tonne Track Machine.
Backfill: Arisings.

Groundwater: Steady flow at several points between depths shown.

Remarks: Trial pit terminated at 3.50m bgl due to pit wall instability.

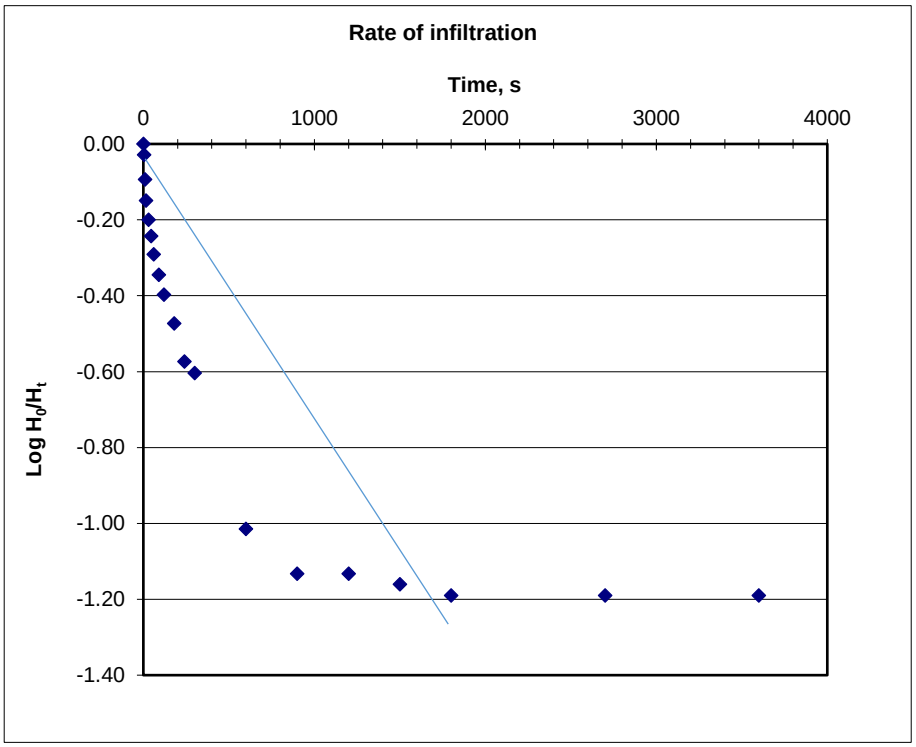
P19012 Falling head permeability test

Location	**Longview**			
BH ID	**RC04**		H_w / H_o	**2.17**
Test	**1**			
Casing diameter	**131**	mm		
Casing depth	**1.5**	m		
Borehole depth	**6.7**	m		
Groundwater level	**2.17**	m bgl		
Date	**18/02/2019**			
Strata				

Min	Sec	depth, m bgl	vol, cu.m	H_t	log H_0/H_t
0	0	0.00	0.00	2.17	0.00
0.08	5	0.14	0.00	2.03	-0.03
0.17	10	0.42	0.01	1.75	-0.09
0.25	15	0.63	0.01	1.54	-0.15
0.50	30	0.80	0.01	1.37	-0.20
0.75	45	0.93	0.01	1.24	-0.24
1	60	1.06	0.01	1.11	-0.29
1.5	90	1.19	0.02	0.98	-0.35
2	120	1.30	0.02	0.87	-0.40
3	180	1.44	0.02	0.73	-0.47
4	240	1.59	0.02	0.58	-0.57
5	300	1.63	0.02	0.54	-0.60
10	600	1.96	0.03	0.21	-1.01
15	900	2.01	0.03	0.16	-1.13
20	1200	2.01	0.03	0.16	-1.13
25	1500	2.02	0.03	0.15	-1.16
30	1800	2.03	0.03	0.14	-1.19
45	2700	2.03	0.03	0.14	-1.19
60	3600	2.03	0.03	0.14	-1.19

k_{mean} **3.91E-06** **ms^{-1}**

$k_H = k_V$



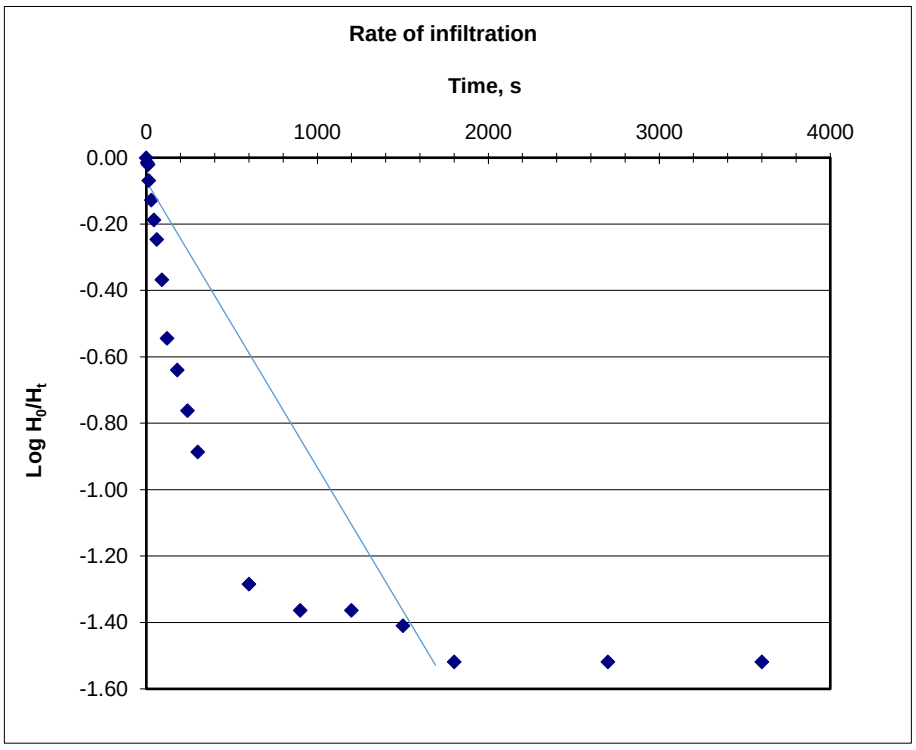
P19012 Falling head permeability test

Location	**Longview**			
BH ID	**RC05**		H_w / H_o	**2.31**
Test	**1**			
Casing diameter	**131**	mm		
Casing depth	**1.5**	m		
Borehole depth	**7.5**	m		
Groundwater level	**2.31**	m bgl		
Date	**18/02/2019**			
Strata				

Min	Sec	depth, m bgl	vol, cu.m	H_t	log H_0/H_t
0	0	0.00	0.00	2.31	0.00
0.08	5	0.08	0.00	2.23	-0.02
0.17	10	0.11	0.00	2.20	-0.02
0.25	15	0.34	0.00	1.97	-0.07
0.50	30	0.59	0.01	1.72	-0.13
0.75	45	0.81	0.01	1.50	-0.19
1	60	1.00	0.01	1.31	-0.25
1.5	90	1.32	0.02	0.99	-0.37
2	120	1.65	0.02	0.66	-0.54
3	180	1.78	0.02	0.53	-0.64
4	240	1.91	0.03	0.40	-0.76
5	300	2.01	0.03	0.30	-0.89
10	600	2.19	0.03	0.12	-1.28
15	900	2.21	0.03	0.10	-1.36
20	1200	2.21	0.03	0.10	-1.36
25	1500	2.22	0.03	0.09	-1.41
30	1800	2.24	0.03	0.07	-1.52
45	2700	2.24	0.03	0.07	-1.52
60	3600	2.24	0.03	0.07	-1.52

k_{mean} **4.99E-06** **ms^{-1}**

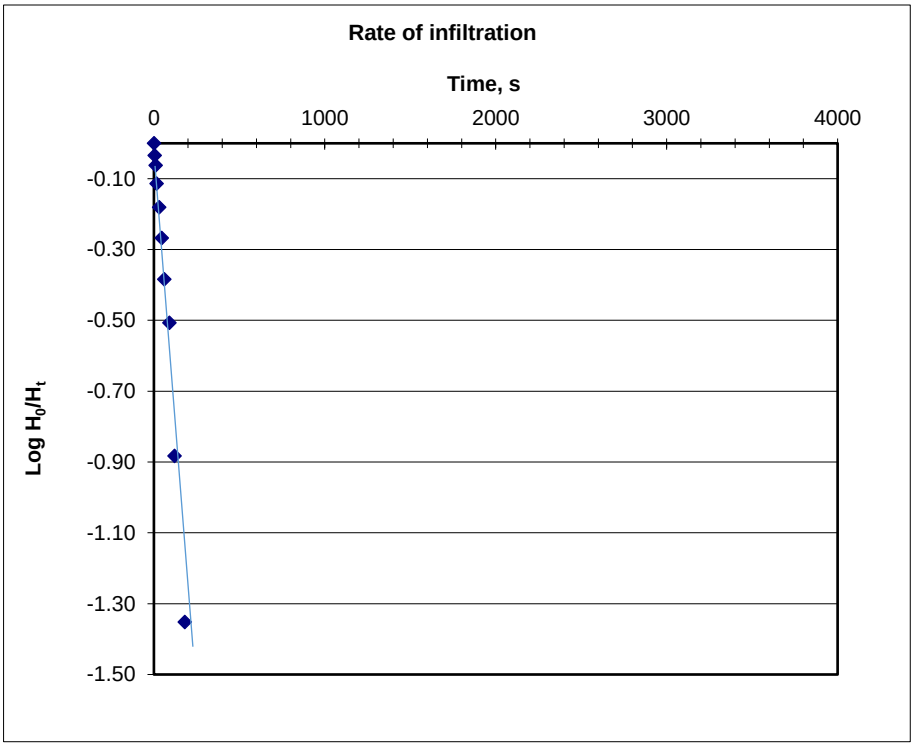
$k_H = k_V$



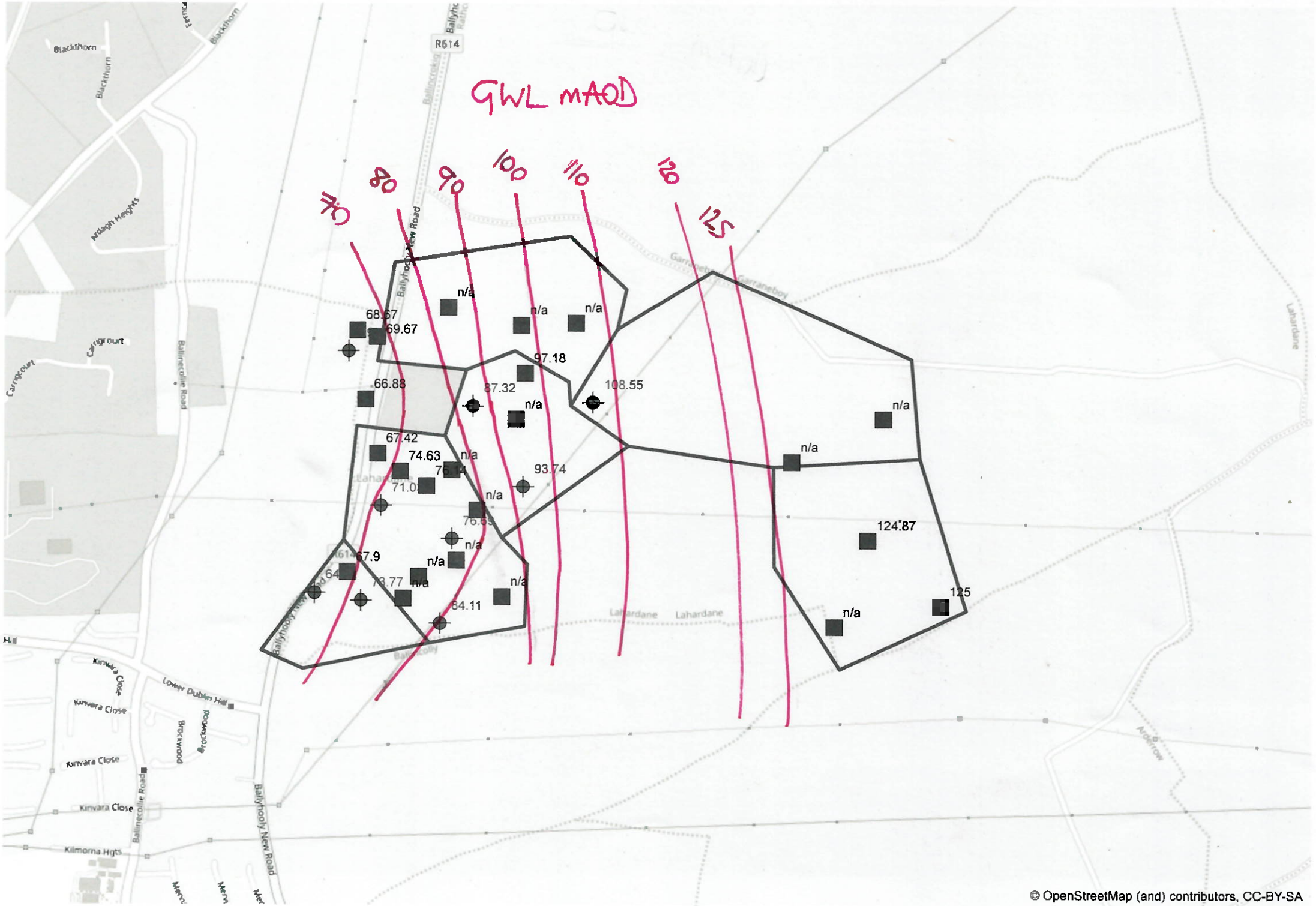
P19012 Falling head permeability test

Location	**Longview**			
BH ID	**RC07**		H_w / H_o	**4.50**
Test	**1**			
Casing diameter	**131**	mm		
Casing depth	**1.5**	m		
Borehole depth	**4.5**	m		
Groundwater level	**4.50**	m bgl		
Date	**17/02/2019**			
Strata				

Min	Sec	depth, m bgl	vol, cu.m	H_t	log H_0/H_t		
0	0	0.00	0.00	4.50	0.00		
0.08	5	0.34	0.00	4.16	-0.03		
0.17	10	0.60	0.01	3.90	-0.06		
0.25	15	1.04	0.01	3.46	-0.11		
0.50	30	1.53	0.02	2.97	-0.18		
0.75	45	2.07	0.03	2.43	-0.27		
1	60	2.64	0.04	1.86	-0.38		
1.5	90	3.10	0.04	1.40	-0.51	k_{mean}	**8.89E-05 ms^{-1}**
2	120	3.91	0.05	0.59	-0.88	$k_H = k_V$	
3	180	4.30	0.06	0.20	-1.35		
4	240	4.50	0.06	0.00	-		



C Groundwater Level Contour Map


GWL mAOD
70
80
90
100
110
120
125
68.67
69.67
66.88
97.18
87.32
108.55
67.42
74.63
71.0
93.74
67.9
73.77
84.11
124.87
125
n/a
R614
Blackthorn
Ardagh Heights
Carrigcourt
Ballinecollie Road
Ballyhooly New Road
Lahardane
Kinvara Close
Brockwood
Lower Dublin Hill
Kilmorna Hgts
© OpenStreetMap (and) contributors, CC-BY-SA

Offices at

Coleshill
Doncaster
Dublin
Edinburgh
Exeter
Glasgow
Haywards Heath
Isle of Man
Limerick
Newcastle upon Tyne
Newport
Peterborough
Saltaire
Skipton
Tadcaster
Thirsk
Wallingford
Warrington

Registered Office
South Barn
Broughton Hall
SKIPTON
North Yorkshire
BD23 3AE
United Kingdom

+44(0)1756 799919
info@jbaconsulting.com
www.jbaconsulting.com
Follow us:

Jeremy Benn Associates Limited

Registered in England 3246693

JBA Group Ltd is certified to:
ISO 9001:2015
ISO 14001:2015
OHSAS 18001:2007